Percutaneous Vaginal Tape Surgery at Stress Urinary Incontinence: Our Medium-Term Results

Stres Üriner İnkontinansta Perkutanöz Vajinal Teyp Cerrahisi: Orta Dönem Sonuçlarımız

Percutaneous Vaginal Tape Surgery

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Özet

Amaç: Stres üriner inkontinans cerrahileri arasında perkütanöz vajinal teyp cerrahisi ucuz ve etkili bir seçenektir. Bu çalışmada perkütanöz vajinal teyp cerrahisi uygulanılan hastalarımızın özelliklerinin ve tedavi sonuçlarının değerlendirilmesi amaçlanmıştır. Gereç ve Yöntem: Perkütanöz vajinal teyp cerrahisi uygulamış olduğumuz 48 hastanın klinik özellikleri retrospektif olarak değerlendirilmiştir. Hastaların kontinansları ve yaşam kaliteleri klinik kontrollerde ve telefon yoluyla sorgulanmıştır. Bulgular: Hastaların ortalama yaşı 51.17±9.96 idi. Ortalama sistometrik kapasite 445±107.08 ml ve operasyon öncesi ve sonrası ortalama Q max değerleri sırasıyla 31.10±11.38 ml/s ve 23.20±14.27 ml/s (p=0.23) olarak bulundu. Ortalama 6 aylık bir süre sonrasında hastaların genel olarak sonuçları 79.2% kür, 18.75% düzelme ve 2.05% başarısız olarak bulundu. Ortalama 58.4 aylık bir süreçte takipte kalan 19 hastadan 16'sında (%84.2) tamamen kür ve 3'ünde (%15.8) başlangıçta olan düzelme sonrası şikayetlerin tekrarladığı tespit edildi. Tartışma: Günümüzde uygulama kolaylığı, başarılı kısa ve orta dönem sonuçlar ve kabul edilebilir düşük komplikasyon riskleri perkütanöz vajinal teyp cerrahisinin stress inkontinans vakalarında iyi bir tedavi alternatifi olabileceğini göstermektedir.

Anahtar Kelimeler

Gerilimsiz Vajinal Tape; Subüretral Sling; Stres Üriner İnkontinans; Ürodinami

Abstract

Aim: Percutaneous vaginal tape surgery is a cheap and effective choice among stress urinary incontinence surgeries. It is aimed to evaluate the characteristics and the treatment results of patients who underwent percutaneous vaginal tape surgery in this study. Material and Method: The clinical characteristics of 48 patients who underwent percutaneous vaginal tape surgery were retrospectively investigated. The patients were asked about ability to hold urine and quality of life during clinical check-ups and by telephone. Results: The average age of the 48 patients was 51.17±9.96 years. The average cystometric capacity was 445±107.08 ml and average Q max values before and after the operation were 31.10±11.38 ml/s and 23.20±14.27 ml/s (p=0.23). The general patient results after an average of over six months were 79.2% cure, 18.75% improvement and 2.05% unsuccessful. Of the 19 patients who remained for monitoring, after an average 58.4 month follow-up 16 (84.2%) patients fully cure, and 3 (15.8%) reported renewal of complaints after initial improvement. Discussion: Currently, application simplicity, short and medium-term successful results, and acceptable low complication rates make percutaneous vaginal tape surgery is a good treatment alternative that can be chosen for stress urinary incontinence cases.

Keywords

Tensionless Vaginal Tape; Suburethral Slings; Stress Urinary Incontinence; Urodynamics

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Introduction

In women, incontinence is a disease that may occur at any age, and causes negative physical, psychological, and socio-economic results. Among incontinence types, stress urinary incontinence (SUI) is defined as involuntary urinary leakage during effort, exercising, sneezing, and/or coughing by the International Continence Society (ICS) in their 2002 terminology report [1]. Though the numbers related to the incidence of SUI vary, generally it is observed at around 30%, with a significant number of patients between 30-60 years, and is known to be the most frequently observed incontinence type in women [2-5]. Whether urethral hypermobility or intrinsic sphincter deficiency underlies beneath the problem, urethral resistance is insufficient to oppose increased abdominal pressure, and increased pressure within the bladder, and incontinence develops. As a result, the basic aim of treatment is to increase urethral resistance. With the underlying physiopathology, and insufficient success of conservative treatments like pelvic floor exercises, surgical treatment stands out for SUI treatment. In the end, SUI is distinguished from other incontinence types by the positive results of surgical treatment. Although different surgical approaches have been described and applied, the basic principle of all techniques is to renew the reduced urethral resistance. Within applied surgical treatment methods, the surgery for suspension of the bladder neck has largely been abandoned today, and sling surgeries such as tensionless vaginal tape (TVT), transobdurator tape (TOT), and percutaneous vaginal tape (PVT) take place instead [6].

Within these methods, the PVT procedure is an effective and cheap choice easily applied to patients for SUI treatment. It is aimed to evaluate the characteristics and the treatment results of our SUI patients with PVT surgery in this study.

Material and Method

The data from 48 patients who underwent PVT from 2003 to 2008 at our clinic were retrospectively evaluated. Before surgery, the patients were asked about clinical complaints such as SUI, urge urinary incontinence (UUI), mix urinary incontinence (MUI), and urgent feelings of urination. All patients had uroflowmetric investigation completed before surgery. Additionally, cystometry and valsalva leak point pressure, bladder capacity, and detrusor activity were evaluated. The presence of pelvic organ prolapse (POP) was researched during physical examination. Additionally to evaluate the degree of urethral hypermobility, the Q tip test was administered. During clinical check-ups, the patients were asked about the presence of all SUI, urgent feelings of urination, and any other complaint. Full urine analysis and uroflowmetry were completed. Additional surgical interventions such as cystocele repair and rectocele repair had administered simultaneously to PVT, if required.

SPSS for Windows, version 17.0 (IBM, USA) was used for the statistical analysis. The results of the descriptive analyses are given as mean±standard deviation or median (min-max). The statistical analyses for the patient group were performed using Paired-Samples T-Test. P-values less than 0.05 were considered to be statistically significant.

Surgical Technique

Patients taken to the dorsal lithotomy position after performing spinal anesthesia. Then, antibiotic prophylaxis administered with ciprofloxacin and the surgical field cleaned with polyvidone-iodine. The technique which has been first described by Rackley et al had apllied [7]. Then 18 fr foley urethral catheter was inserted into the bladder in order to empty it. Before incision, the paraurethral submucosal region was injected with lidocaine solution containing 0.0125 mg/ml concentration of adrenalin in order to reduce bleeding during the incision. A vertical 1-1.5 cm vaginal incision was made in the central urethral region. Paraurethral dissection was completed on bilateral sides of the incision. On both sides of the symphysis pubis at 2-3 cm distance, an incision was made the same size as the tip of a 15 number scalpel. Then a Stamey needle was advanced anterograde and turned slightly lateral towards the dissected paraurethral areas in the vagina. With the aid of these needles, polypropylene mesh (monofilament and wide mesh) cut to 1.1 cm wide and 30 cm long was inserted tension-free on to the middle of the urethra/bladder neck. After checking the integrity of the urethra and bladder with cystoscopy, a foley urethral catheter was again inserted into the bladder. Primary repair of the vaginal mucosa was completed, and the procedure ended.

All patients' urethral catheters were removed on postoperative 24th hour, and they were discharged on the same day, as well.

Results

The general characteristics and findings of the 48 patients included into the study are given in Table 1. The mean age of patients was 51.17±9.96 years, and the mean body mass index was 28.44±4.08 kg/m2. At the time of application, while only 15 of the 48 patients described SUI, 33 patients described MUI with SUI leading their complaints. Urodynamic investigation did not find detrusor over activity (DOA) in 23 of the 33 patients (69.7%) who described MUI. In 12 patients with DOA, 10 had MUI while 2 had only SUI. The mean cystometric capacity was 445 ± 107.08 ml, while the valsalva leak point pressure had an average of 77.28±31.68 cmH2O. The average degree for the Q tip test was 400 (100 -600). The average Q max values for patients before and after the operation were found to be 31.10±11.38 ml/s and 23.20±14.27 ml/s, respectively (p=0.23). The average duration of surgery was found to be 27.5±6.68 minutes. In addition to PVT application, 1 patient had cystocele repair, 3 patients had rectocele repair, 1 patient had both cystocele and rectocele repair, and 1 patient had vaginal hysterectomy in addition to cystocele and rectocele repair.

As complications; urinary retension, denova urge syndrome, vaginal erosion, and dysparenuia had been developed after the surgery at 3, 6, 2, and 1 patients, respectively. (Table 2). All complications were treated either with surgically and/or me-

Table 1. General characteristics of patients

Age	51.17 ± 9.96
Parity	5 (1-12)
Vaginal Birth	3 (0-8)
Valsalva leak point pressure (cmH2O)	77.28 ± 31.68
Body mass index (kg/m2)	28.44 ± 4.08
Q tip test	400 (100 -600)
Mixed urinary incontinence (N)	33 (68.8%)
Stress urinary incontinence (N)	15 (31.2%)

Table 2. General information related to surgical treatment

		N (%)
Additional surgical treatment	Cystocele repair	1
	Rectocele repair	3
	Cystocele repair + Rectocele repair	1
	Cystocele repair + Rectocele repair + Hysterectomy	1
Complications	Retention	3 (6.25%)
	De nova urge syndrome	6 (12.5%)
	Vaginal erosion	2 (4.2%)
	Dyspareunia	1 (2.1%)
Results	Cure	38 (79.2%)
	Improvement	9 (18.75%)
	Left Follow-up	1 (2.05%)

dically.

The general patient results over an average of more than 6 months were as 79.2% (n=38) cure, 18.75% (n=9) improvement, and 2.05% (n=1) unsuccessful. Cure has been obtained at the patients with only SUI, improvement and failure have been obtained at the 9 and 1 patients with MUI, respectively. Of the 19 patients who remained in follow-up over 58.4 months monitoring, 16 (84.2%) had cure, while 3 (15.8%) had reported renewal of complaints after initial improvement. Six of 19 patients with 58.4 months follow-up was SUI patients. Cure was achieved at all these patients. Symptoms recurred at 3(23.1%) of 13 patients describing MUI. The other 10 patients was fully cured (76.9%).

Discussion

Due to its high prevalence, and negative physical, psychological, and socioeconomic results it causes, patients have been continuously searching for treatment of SUI for years, and many retropubic and vaginal surgical methods have been tried. However, the majority of these surgical methods used in the past, especially retropubic approaches (Burch, Marshall-Marchetti-Krantz etc.), are no longer used. The most important reasons for that are the application simplicity, short learning curve, and, of course, the successful results of the sling operations. However, correct patient selection and correct surgical technique are very important in order to obtain that successful results. For a patient describing stress SUI one of two basic reasons may cause the complaint to occur. Either urethral hypermobility and/or intrinsic sphincter deficiency may be present, or DOA triggered by stress may be the problem [8]. Detailed history, physical examination, and urodynamic investigation are necessary to make this distinction correctly. In the situation of DOA triggered by stress, it may be appropriate to try medical treatment rather than surgical ones. However, these patients should not be confused with the patient group who describe MUI. Patients describing MUI with a component of SUI are recommended to have surgical treatment [8-10]. Of course, it is important this component have a significant place in the patient's complaint. In our patient group of the 48 patients given surgical treatment, 33 had MUI, and in all patients at the clinic stress urinary incontinence was the main problem. Urodynamic investigation of 33 MUI patients revealed that only 10 had DOA. All 10 patients with DOA had used anticholinergics, but found no benefit. Whereas, failure has been observed at only one patient with 6 months of short-term follow-up results of MUI patients'. Full cure was found at 76.9% of these patients at long-term follow-up results. This finding supports the opinion that patients with MUI with leading a SUI component may have benefit from surgical treatment.

Previously PVT and similar sling surgeries were recommended, especially for type III SUI. But recently, the success of sling applications have changed the algorithm, and become the 'Gold Standart' treatment option for all SUI cases, regardless of the sub group [11-13]. Different studies have reported success rates of PVT, and similar loose suspension surgeries between 75-100%, making PVT and similar sling surgeries the perfect treatment alternatives for stress urinary incontinence with these results [13-16]. In our patient group, general patient results over more than six months were showed 79.2% recovery, 18.75% improvement, and 2.05% unsuccessful. Of the 19 patients who remained in follow-up over 58.4 months monitoring, 16 (84.2%) had full recovery, while 3 (15.8%) reported renewal of complaints after initial improvement. An interesting point is that the 3 patients reporting renewal of complaints had full recovery for the first 2 years after surgery, but then they reported the renewal of complaints after two years. This results showed that the short term results of patients with full recovery may be better than long term results, and it is considered that at least 24 months duration of follow-up period is needed for making a final conclusion about recovery.

Bladder outlet obstruction is a confusing issue about PVT and similar sling surgeries [11,17]. However, Kuo et al. [15,18] reported that only few patients had a slight increase in urine pressure after the surgery in their series. In our clinic, uroflowmetric investigation was completed before and after surgery for all patients. In conclusion, the Qmax values before surgery were 31.10±11.38 ml/s, and after surgery were 23.20±14.27 ml/s (p=0.23). Except 3 patients developing retention, no patient was found to have any clinically significant residual urine. Among these 3 patients, one had only urethral catheterization for a while, and the other 2 had urethra dilatation applied to void properly. After treatments, the retention resolved in these 3 patients, and the mean Qmax value of 18 had reached. These results show that after correct tension-free PVT surgery, bladder outlet obstruction is not frequently observed, and leads to the consideration that it is not of a scale to change the patients' micturation physiology.

Apart from bladder outlet obstruction, there may be different undesireable side effects of PVT surgery. Although de-novo detrusor instability, mesh erosion, urinary system infections, bladder injury, large vein injury, and intestinal perforation are described for TVT and similar suspension surgeries, we do not see the possibility of intestinal, and/or large organ injury with appropriate technique for PVT surgery. However, it is an obvious reality that this risk may be higher for patients with previous history of pelvic and/or incontinence surgery. In our 48 patient series we did not encounter any organ injury, including the bladder as well. Technically bladder injury risk is higher than other organ injuries; however, the needle structure used with PVT, ensuring that the bladder is empty, and appropriate surgical tech-

nique had significantly lower the risk of bladder injury. In spite of this, as stated in the literature, the bladder injury risk is higher than for TOT surgery [19-21].

In our patient group de-novo urge syndrome was the most frequently encountered complication (12.5%, n:6). In the literature, although there is a wide interval of 9-30% defined for this rate, we observed completely resolution of this complication over time with support treatment of anticholinergics [14,17]. A more frustrating complication for both surgeon and patient is vaginal erosion and/or sling material infection. In our 48 patient series, we encountered vaginal erosion in 2 patients (4.2%). The two patients had the periurethral mesh removed, and repair completed surgically. A question that arises is whether the use of synthetic material increases the risk of development of vaginal erosion or not. The polypropylene mesh used in our patients has the ideal sling material characteristics of not being absorbable, and being easy to access and apply. There is information that especially mesh of Type I material with macroporous and monofilament characteristics reduces the risk of erosion and infection [22,23]. In our patient group, we used monofilament polypropylene mesh with Type I characteristics, and only encountered vaginal erosion in 2 patients. In conclusion, our rate of vaginal erosion is not that different from the literature rates [9,10,24]. In the light of this data, when hernia and cosmetic problems of autologous material are noted, and when the infection and rejection risk of allograft and xenograft sling material are considered, we think that monofilament polypropylene mesh is a reasonable option.

Application of either PVT or TOT is one of the two best methods for SUI patients. In the recent years, the lower risk of bladder injury and lack of requirement for cystoscopy during surgery mean there is an increase in the application of TOT observed. When the literature is examined though there is not much data comparing the two methods. But, when retropubic suspension surgery is compared with the TOT method, we see the 12 month success results are similar [25]. Comparing the long term results of both methods with larger patient series may be indicative of which method should be chosen over time.

Currently the application simplicity, short and medium-term successful results and acceptable low complication rates make PVT a good treatment alternative that can be chosen for most of SUI cases.

Competing interests

The authors declare that they have no competing interests.

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